REMARKS

This response is intended as a full and complete response to the Office Action dated February 10, 2004. In view of the following discussion, the Applicants believe that all claims are in allowable form.

IN THE TITLE

The Title is objected to as non-descriptive. In response, the Applicants have amended the Title as suggested by the Examiner. Accordingly, the Applicants respectfully request the objection be withdrawn.

IN THE SPECIFICATION

The Applicants have amended paragraph **[0018]** of the Specification to correct a minor typographical error. The Applicants have also amended paragraph **[0025]** to clarify that the pressure of the chamber is at least as low as $1x10^{-5}$ torr. Accordingly, the Applicants respectfully request the objections to these two paragraphs be withdrawn.

CLAIM REJECTIONS

35 U.S.C. §103 Claims 1-9

A. Claims 1-7

Claims 1-7 stand rejected as being unpatentable over Japanese Patent Application Publication No. JP08141276, Published December 22, 1997 by Toyoda et al. (hereinafter *Toyoda*), in view of United States Patent No. 6,139,983 issued October 31, 2000 to Ohashi et al. (hereinafter *Ohashi*), and further in view of United States Patent No. 6,287,683 issued September 11, 2001 to Itoh et al. (hereinafter *Itoh*), United States Patent No. 4,637,684 issued January 20, 1987 to Tomita et al. (hereinafter *Tomita*), and United States Patent No. 6,162,495 issued December 19, 2000 to Morton (hereinafter *Morton*). The Applicants respectfully disagree.

Claim 1 recites limitations not taught or suggested by the prior art, either alone or in combination. *Toyoda* teaches a method of coating an aluminum nitride part with a

coating of magnesium fluoride by vacuum deposition or sputtering. *Toyoda* does not teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1. The Examiner asserts that since *Toyoda* discloses using a deposition sputtering target of having a purity of 99.5%, that would suggest to one of ordinary skill in the art that *Toyoda* is concerned with and desires depositing a coating having a high purity. However, utilizing a high purity sputtering target does not necessarily imply a specific purity or density for the resultant coating. Moreover, as the Examiner admits, *Toyoda* is silent regarding the density and purity of the magnesium fluoride coating.

Ohashi teaches a corrosion-resistant wafer supporting member having a corrosion-resistant layer which may comprise magnesium fluoride. *Ohashi* discloses that the method of producing the fluoride coating is not particularly limited, so long as defects and pinholes are not formed in the film. (*Ohashi*, column 6, lines 15-18). *Ohashi* is also silent regarding the density and purity of the magnesium fluoride coating and does not teach or suggest that either the purity or the density of the magnesium fluoride layer is critical in the formation of an effective protective coating in a corrosive semiconductor process environment. Thus, the combination of *Toyoda* and *Ohashi* teaches or suggests, at most, a coating of magnesium fluoride that is substantially free of defects and pinholes in the film. Such combination still does not teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Itoh teaches that the adjustment of the packing rate of a magnesium fluoride coating can be controlled by controlling the degree of vacuum and the film-forming temperature in a vacuum process. *Itoh* is silent with regard to the density and purity of magnesium fluoride coating. The Examiner contends that as *Itoh* teaches a method of controlling the packing rate of a magnesium fluoride film, it would be obvious to use that method in combination with *Toyoda* and *Ohashi* to form a magnesium fluoride coating having a density of at least about 85%. However, neither *Toyoda*, *Ohashi*, nor *Itoh* teaches or suggests a magnesium fluoride coating having a density of at least about 85%. Moreover, as discussed above, the desire to have a pinhole and defect-free film

is not a suggestion or motivation to deposit a film having a density of at least about 85%, as recited in claim 1. As such, the combination fails to teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99% as recited by claim 1.

Tomita teaches that a thin layer of magnesium fluoride may be formed on a surface by evaporation and may have a low porosity by heating the substrate to the order of 300°C during evaporation. *Tomita* is silent with respect to specific density and purity of the magnesium fluoride coating and does not mention any corrosion resistant benefits of the film. Therefore, the combination of *Tomita* with *Toyoda*, *Ohashi* and *Itoh* teaches only a magnesium fluoride coating that should be free of defects and pinholes, where the packing rate of the film can be adjusted by controlling the degree of vacuum and the film-forming temperature and where low porosity can be obtained by heating the substrate to the order of 300°C during evaporation. However, this combination still fails to teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Morton teaches an electron beam physical vapor deposition method whereby a pure and dense coating of magnesium fluoride may be deposited on a substrate of aluminum in a vacuum chamber having a pressure of $1x10^{-6}$ torr or less. *Morton* is silent with respect to the density and purity of the magnesium fluoride coating. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to "optimize" as result-effective variables, the temperature and pressure of the magnesium fluoride deposition process of *Toyoda* through routine experimentation in order to obtain a "optimized" magnesium fluoride coating that has both the high purity and density recited in claim 1. However, the Examiner erroneously equates the statement of *Ohashi* that the coating be free of defects and pinholes with having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1. A film need not be highly pure nor highly dense in order to be free of defects and pinholes. In particular, *Ohashi* teaches a pressure of $5.25x10^{-3}$ - $3.75x10^{-2}$ torr to deposit a magnesium fluoride film that is free of pinholes and defects. There is no suggestion in *Ohashi*, or any of the other cited references, that further reduction in chamber pressure would be desirable.

Specifically, there is no suggestion that reducing the chamber pressure below the range taught by *Ohashi* (for example, to 1 x 10^{-6} torr as in *Morton*) would continue to yield a magnesium fluoride film that is free of defects and pinholes, or which yields a film having a specific density and purity. A teaching of how to produce a magnesium fluoride film having the specific properties recited by claim 1 is simply not taught or suggested by the references, either alone or in combination. Therefore, there is no teaching or suggestion in the art to combine the references to obtain a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Thus, the Applicants submit that independent claim 1, and all claims depending therefrom, are patentable over *Toyoda* in view of *Ohashi* and further in view of *Itoh*, *Tomita*, and *Morton*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

B. Claim 8

Claim 8 stands rejected as being unpatentable over *Toyoda*, in view of *Ohashi*, in further view of *Itoh*, *Tomita*, and *Morton*, and in further view of United States Patent No. 5,643,483 issued July 1, 1997 to Kubota et al. (hereinafter *Kubota*). The Applicants respectfully disagree.

Claim 8 recites limitations not taught or suggested by the prior art, either alone or in combination. As discussed above, *Toyoda*, *Ohashi*, *Itoh*, *Tomita*, and *Morton* are not combinable in a manner which yields the invention recited in claim 1, from which claim 8 depends. *Kubota* teaches and suggests a ceramic heater having a smooth surface in the range of from 0.01μm – 0.1 μm. *Kubota* does not teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1. Therefore, *Kubota* may not be used to modify the teachings of the previously cited references to yield a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Thus, the Applicants submit that claim 8 is patentable over *Toyoda* in view of *Ohashi*, in further view of *Itoh*, *Tomita*, and *Morton*, and in further view of *Kubota*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

C. Claim 9

Claim 9 stands rejected as being unpatentable over *Toyoda*, in view of *Ohashi*, in further view of *Itoh*, *Tomita*, and *Morton*, and in further view of United States Patent No. 6,215,806 issued April 10, 2001 to Ohmi et al. (hereinafter *Ohmi*). The Applicants respectfully disagree.

Claim 9 recites limitations not taught or suggested by the prior art, either alone or in combination. As discussed above, *Toyoda*, *Ohashi*, *Itoh*, *Tomita*, and *Morton* are not combinable in a manner which yields the invention recited in claim 1, from which claim 9 depends. *Ohmi* teaches and suggests a fluoride passivated inner surface of an excimer laser. Contrary to the Examiner's assertion, the only heat treatment of a magnesium fluoride film described in *Ohmi* is in a temperature range of 150 to 450°C. (*Ohmi*, col. 11, ll. 51-61). Therefore, *Ohmi* does not teach or suggest annealing a magnesium fluoride film at a temperature of at least about 600°C, as recited in claim 9.

Moreover, *Ohmi* does not teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1. Therefore, *Ohmi* may not be used to modify the teachings of the previously cited references to yield a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Thus, the Applicants submit that claim 9 is patentable over *Toyoda* in view of *Ohashi*, in further view of *Itoh*, *Tomita*, and *Morton*, and in further view of *Ohmi*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

D. Claims 1 and 3-6

Claims 1 and 3-6 stand rejected as being unpatentable over *Tomita* in view of *Morton*. The Applicants respectfully disagree.

Claim 1 recites limitations not taught or suggested by the prior art, either alone or in combination. As discussed above, *Tomita* discloses that a low porosity magnesium fluoride coating may be formed by heating the substrate to about 300°C, but fails to teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

As also discussed above, *Morton* teaches an electron beam physical vapor deposition method whereby a pure and dense coating of magnesium fluoride may be deposited on an aluminum substrate in a vacuum chamber having a pressure of $1x10^{-6}$ torr or less. *Morton* is also silent with respect to the density and purity of the magnesium fluoride coating. Moreover, neither *Morton* nor *Tomita* contain any suggestion to combine the low pressure deposition method of *Morton* with the method of *Tomita*. The Examiner contends that *Tomita* desires a pure, dense magnesium fluoride film. However, *Tomita* makes no reference to the purity level of the magnesium fluoride film nor to the specific density of the film obtainable by the *Tomita* process. Therefore, *Morton* cannot be combined with *Tomita* in a manner which yields a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

The Applicants further submit that it is well known in the art that it is more difficult and expensive, from an equipment perspective, to deposit films at lower versus higher pressures. As such, absent a clear motivation to investigate modifying the deposition methods of *Tomita* to utilize the low pressure deposition methods disclosed in *Morton*, one skilled in the art would not think to deposit a magnesium fluoride coating at the low pressures disclosed in *Morton* when a satisfactory process existed that utilized higher deposition pressures. Therefore, *Morton* is not permissibly combinable with *Tomita* in a manner which yields a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Thus, the Applicants submit that claims 1 and 3-6 are patentable over *Tomita* in view of *Morton*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

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E. Claim 2

Claim 2 stands rejected as being unpatentable over *Tomita* in view of *Morton*, and in further view of *Itoh*. The Applicants respectfully disagree.

As discussed above, there is no suggestion to modify *Tomita* with *Morton*. *Itoh*, also discussed above, teaches that the higher the pressure and lower the temperature, the lower the density of a deposited magnesium fluoride film. *Itoh* does not disclose a magnesium fluoride film having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1. For the same reasons as discussed previously, the mere fact that *Itoh* discloses a mechanism by which one may adjust the density of a deposited film provides no motivation to alter the disclosed processes of another reference. Therefore, there is no motivation to combine the teachings of *Tomita*, *Morton*, and *Itoh*.

Thus, the Applicants submit that claim 2 is patentable over *Tomita* in view of *Morton*, in further view of *Itoh*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

F. Claim 9

Claim 9 stands rejected as being unpatentable over *Tomita* in view of *Morton*, in further view of *Itoh*, and in further view of *Ohmi*. The Applicants respectfully disagree.

As discussed above, there is no suggestion to modify *Tomita* with either *Morton* or *Itoh*, alone or together. As also discussed above, the only heat treatment of a magnesium fluoride film described in *Ohmi* is in a temperature range of 150 to 450°C. (*Ohmi*, col. 11, ll. 51-61). Therefore, *Ohmi* does not teach or suggest annealing a magnesium fluoride film at a temperature of at least about 600°C, as recited in claim 9.

Moreover, *Ohmi* does not teach or suggest a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1, from which claim 9 depends. Therefore, *Ohmi* may not be used to modify the teachings of the previously cited references to yield a magnesium fluoride coating having a density of at least about 85% and a purity of at least about 99%, as recited in claim 1.

Thus, the Applicants submit that claim 9 is patentable over *Tomita* in view of *Morton*, in further view of *Itoh*, and in further view of *Ohml*. Accordingly, the Applicants respectfully request the rejection be withdrawn.

NEW CLAIMS

New claims 10-18 have been added to the Application. Claims 10-18 depend from claim 1 and add additional limitations thereto. As such, the Applicants submit that claims 10-18 are patentable over the art of record for at least the reasons discussed above. The Applicants further submit that the claims are fully supported by the specification and that no new matter has been added.

CONCLUSION

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

If, however, the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

May 7, 2004

Keith P. TABOADA
Attorney Reg. No. 45,150
(732) 530-9404

Moser, Patterson & Sheridan, LLP
595 Shrewsbury Avenue
Suite 100
Shrewsbury, NJ 07702